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**ENHANCING THE PERFORMANCE OF GRADE VI-C PUPILS
OF BUYAGAN ELEMENTARY SCHOOL THROUGH THE
USE OF ARTS IN MATH (AIM)**

by

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ABSTRACT

The action research aims to enhance the performance of *Grade VI-C Pupils* in Mathematics in Buyagan Elementary School through the use of Arts In Math (AIM). Specifically, the action research sought to: 1) use Arts in Math (AIM) to enhance the mastery level of Grade VI-C in Mathematics, 2) improve comprehension skills of Grade 6 on Mathematics concepts through the use of “Arts in Math (AIM)”, 3) use “Arts In Math (AIM)” to stimulate, motivate and sustain pupils’ interest in Mathematics and 4) improve the teaching strategy in Mathematics through AIM.

The study was conducted for two quarters from June-October 2015(1st and 2nd Grading) with 46 pupils as the target subjects. The study made use of the one -shot experimental design to look into the effectiveness of “Arts In Math (AIM)” in improving pupils’ performance in Mathematics.

The findings showed that the use of Arts In Math (AIM) enhanced the performance of *Grade VI-C Pupils* in Mathematics. For the first quarter, there was an increase of 34.13 in the MPS and 29.79 for the second quarter. Using the t-test of the difference between means of correlated data, the t- test computed value of 23.71 for the first quarter and 32.37 for the second quarter is more than the critical value of 1.676 at 0.05 level of significance with 45 degrees of freedom.

In conclusion, Arts In Math (AIM) enhanced mastery learning and comprehension of *Grade 6-C pupils* based from the pretest and posttest. There was a significant difference between the means of pretest and posttest using t-test as the statistical treatment. In addition, Arts in Math (AIM) stimulated, motivated and sustained pupils’ interest. Furthermore, Arts In Math (AIM) improved the teaching strategy in Mathematics. As to the recommendations, teachers should be encouraged and motivated to use Arts In Math so as to enhance pupils’ performance in Math. Moreover, integration of arts should not only be used in teaching Mathematics but also with other subjects. The school head should encourage and support the generation and use of the Arts In Math (AIM).

I. INTRODUCTION

The world today is undergoing a tremendous change which causes a chain of problems and challenges to mankind. Man is endowed with intelligence and is making use of his ingenuity to wrestle with these brain-pain problems not only to cope with and be attuned with the changing times but most especially to survive. Mathematics is one of those disciplines greatly influenced by the process of change in our world today.

In the words of Adler, Mathematics is the handmaiden of science, is also the art which expresses beauty through a system of definitions, axioms and theorems. It is one of the most important tools man has forged in his quest to understand and control his environment. Since Mathematics is an indispensable tool for technological age, it is the role of mathematics teachers to provide opportunities to pupils to learn materials which may be considered new or modern.

Most failure in Mathematics is due to the sole memorization with devoid understanding. Pupils lack the application of skills and techniques which help the pupils develop their critical thinking, reasoning power and creative minds which they use in working independently in any kind of Mathematics activities.

It was observed that pupils easily get bored in solving pure numbers during their Math period. They enjoy more in their ARTS subject which has something to do with drawing and coloring pictures. They are more behaved in doing their arts activities independently.

In Buyagan Elementary School, Mathematics had been noted as one of the most difficult subject since it consists of a collection of facts and skills to be memorized or mastered by a relatively heterogeneous group of pupils.

The result of the National Achievement Test (NAT) in Mathematics in the year 2013 is 66.32% and in the year 2014 is 68.82%. Though it shows that it is increasing, it did not yet reach the 75% standard level.

The researcher in her role as a Mathematics teacher concerned herself on how to help the pupils perform better in the field of Mathematics. This concern made the researcher planned to find possible solutions that could assist the Grade Six Section C pupils of Buyagan Elementary School in enhancing their level of performance in Mathematics.

II. METHODOLOGY

The researcher used **ARTS IN MATH (AIM)** as a strategy that would enhance the performance of Grade VI Section C pupils of Buyagan Elementary School in Mathematics during the school year 2015-2016.

Arts in Math (AIM) is an excellent strategy. This makes use of instructional approaches which attempts to make the process of learning mathematics more enjoyable, more exciting and more meaningful. It significantly improves mastery of key concepts and vocabulary. It helps the pupils relax and reduce the stress which many of the pupil's experience as a result of Math anxiety.

According to John Malkevitch (2012) in his Mathematics and Art feature Column from the AMS, all students are gifted and using arts in math gives artistically gifted children a chance to shine. For right-brained children (who are often left-handed), art engages the right brain which is a critical part of their ability to learn math concepts and vocabulary. In addition to this benefit- art activities are fun for everybody, and since authentic learning is linked to emotion, it makes sense to incorporate art whenever possible in teaching Math.

Arts In Math (AIM) calls for simple and direct instruction that aims to help pupils memorize fundamental mathematical concepts while having arts. The pupils can use colors and shapes to enhance their understanding of Math. The materials are in the form of activity sheets that will be used inside the classroom and are used in selected topics. The pupils will answer or solve mathematics sentences before they are going to perform art activities like coloring or painting.

Here are the activities and lesson ideas using Arts in Math:

- **Color My Petals** : Make the petals of the flower colorful by applying different colors but the pupils will have to add and subtract decimal numbers first.

- **My Cutie Puppy** : This activity focuses on multiplying decimals by 0.1, 0.01 and 0.001. The pupils will find the product and color the parts of the puppy according to the given codes.
- **Answer, Find and Color**: This activity is about multiplication of decimals. The pupils are going to answer the given numbers, find the product and color the picture according to the given codes.
- **Solve, Find and Shade**: These activities cover division of decimals. The pupils are going to solve, find the quotient and shade the parts of each drawing according to the given codes.
- **Funny Tweety**: This activity is an enjoyable and interesting way to identify prime and composite numbers.
- **My Chubby Pooh** : This activity is on identifying equivalent fractions. The pupils are task to find the fractions equivalent to the given set of fractions before applying colors on Pooh's clothes.
- **Treasure Hunting**: It focuses on determining and matching the GCF of 2 numbers placed below the miners' carts and the gold bars.
- **Food Delivery Maze**: It requires the pupils to change the fractions to decimals until they will reach grandma's house and delivers the food.

III. RESULT AND DISCUSSION

Arts in Math (AIM) was used in the teaching-learning process for the first and second quarters of the school year 2015-2016 to enhance the performance in Mathematics of the Grade 6 section C pupils of Buyagan Elementary School.

Different activities using Arts in Math were used in the development of lessons as well as during the preparatory activities and evaluation activities. The researcher used Arts in Math (AIM) in almost all the least learned competencies in Mathematics.

The result of the teaching-learning process is presented basing on each objective. They are as follows:

A. Effectiveness of Arts in Math (AIM) in enhancing the mastery learning of Grade 6-C pupils in Mathematics

Arts in Math (AIM) particularly the use of drawing, coloring, painting, and etching activities in teaching the competencies enhanced the learning of the Grade 6-C pupils in Mathematics. During the teaching of Mathematics, different individual and group activities were used to add, subtract, multiply, divide decimals, identify prime and composite numbers, find equivalent fractions, determine GCF and LCM, change fractions to lowest terms, reduced fractions, add, subtract, multiply and divide similar and dissimilar fractions.

Table 1 shows the pretest and posttest results for the two quarters- first quarter and second quarter.

Results show that there was an increase of 34.13 in the MPS for the first quarter and 29.79 for the second quarter. The increase in the mean score which indicated great difference between the pretest and posttest evidently validated the claim that pupils exposed to creative, exciting and varied activities had better retention and had mastered the lessons.

Table 1 also presents the results of the t-test statistics between the pretest and posttest for the first quarter and second quarter.

Using the t-test of the difference between means of correlated data, the t- test computed value of 23.71 for the first quarter and 32.37 for the second quarter is more than the critical value of 1.676 at 0.05 level of significance with 45 degrees of freedom. The result shows that Arts In Math (AIM) is an effective tool in improving learning in Mathematics.

Table 1: Mean Difference of the Pre-test and Post Test score in AIM

Quarter	Test	Mean	Standard Deviation	Computed t	df	Tabulated value of t at 0.05 level of significance
1 st	Pre-test	14.57	4.86	23.71	45	1.676
	Post test	31.63				
2 nd	Pre-test	16.02	3.15	32.37	45	1.676
	Post-test	30.91				

B. Improved comprehension skills of Grade 6 on Mathematics concepts through the use of Arts In Math (AIM)

Using Arts In Math (AIM) in teaching Mathematics showed that there was an improvement on the comprehension skills of the pupils on Mathematics concept. Individual and group arts activities in the development of the lessons, lesson proper and during the evaluation of learning outcomes were used.

Table 2 presents the mastery indices of the different competencies for the first grading examination. It could be seen that most of the competencies are under Closely Approximating Mastery (CAM) and Mastered (M). Of the 15 competencies, six (6) were under Mastered (M) and nine (9) were under Closely Approximating Mastery. This could be attributed from the effect of the Arts in Math (AIM) used in classroom instruction.

Table 2: Mastery Index per Competency in Math 6 First Grading Examination

COMPETENCIES	Average Number of Correct Responses	Percentage of Correct Responses	Mastery Level
1. Translate word phrase to numerical expressions.	43	93%	CAM
2. Write correct equation for a problem/situation.	40	87%	CAM
3. Evaluate an expression with/without exponents.	40	87%	CAM
4. Identify the value/place value of a digit in a given decimal.	41	89%	CAM
5. Compare and order decimals through ten thousandths.	43	93%	CAM
6. Estimate sums and differences of whole numbers and decimals.	40	87%	CAM
7. Add and subtract whole numbers and decimals.	46	100%	M
8. Solve 2 to 3 step word problems involving addition and subtraction of decimals.	44	96%	M
9. Multiply whole numbers and decimals.	44	96%	M

10. Multiply decimals by 10,100, 1000.	46	100%	M
11. Multiply decimals by 0.1,0.01,0.001.	46	100%	M
12. Solve 1- to 3- digit by 1- to 2-digit factors of decimals and numbers with zero difficulty.	44	96%	M
13. Solve word problems involving whole numbers and decimals including money.	43	93%	CAM
14. Estimate quotients of whole numbers and decimals.	38	83%	CAM
15. Divide 2- to 5- digit whole numbers by 1- to 2- digit decimals.	38	83%	CAM
<ul style="list-style-type: none"> • M- Mastery • CAM- Closely Approximating Mastery 			

Table 3 presents the mastery indices of the different competencies for the second grading examination. Of the 19 competencies, four (4) were under Mastered (M), fourteen (14) were under Closely Approximating Mastery (CAM) and one (1) was under Moving Towards Mastery (MTM).

Table 3: Mastery Index per Competency in Math 6 Second Grading Examination

Competencies	Ave. No. of Correct Responses	Percentage of Correct Responses	Mastery Level
1. Divide whole numbers by 1-to 2-digit decimals.	39	85%	CAM
2. Divide a whole number by decimal and mixed decimal	38	83%	CAM
3. Divide mixed decimals by mixed decimals.	36	78%	MTM
4. Divide decimals by 10, 100, 1000,0.1,0.01.and0.001	43	93%	CAM
5. Solve word problem involving division of decimals including money	38	83%	CAM
6. Identify prime and composite numbers	46	100%	M
7. Determine the greatest common factor(GCF)of 2 or more numbers	40	87%	CAM
8. Determine the least common multiple(LCM)of 2 or more numbers.	40	87%	CAM
9. Rename fractions as decimals and vice versa	39	85%	CAM
10.Reduce fractions to lowest term.	42	91%	CAM
11.Change mixed numbers to improper fraction or vice versa.	44	96%	M
12.Estimate fractions close to 0,1/2, or 1	38	83%	CAM
13.Find the least common denominator(LCD) of a set of numbers.	43	93%	CAM
14.Order fractions in simple or mixed forms in ascending or descending order.	46	100%	M
15.Add similar fractions in simple or mixed form with regrouping.	44	96%	M
16. Subtract similar fractions in simple and mixed forms with or without regrouping.	41	89%	CAM
17. Add dissimilar fractions with or without regrouping.	40	87%	CAM
18. Subtract dissimilar fractions with or without regrouping.	40	87%	CAM

19. Analyze and solve 1-to 2- step word problems involving addition or subtraction of fractions in simple or mixed forms with or without regrouping.	38	83%	CAM
<ul style="list-style-type: none"> • M- Mastery • CAM-Closely Approximating Mastery • MTM-Moving Towards Mastery 			

C. Used Arts In Math (AIM) to stimulate, motivate and sustain pupils' interest

The study used different arts activities in teaching Mathematics 6. Coloring activities for individual work and group work were used. Aside from coloring activities, painting, colored paper tearing, sprinkling, cutting and crayon etching were also done.

According to Larrick (1953) as cited by Agnasi (2013), there is no substitute for the study of the interest of the individual; we must make the most of the children's interest because it is the starting point for the improvement, a barometer of proficiency and as a criterion of the success of school instruction.

It was observed that whenever the lessons were presented using Arts In Math (AIM), the pupils became more interested and active in all the activities. Pupils' interest throughout the teaching-learning process was very evident.

Table 4 presents the attendance of the pupils for the first and second quarters. Results show that there were 100% of attendance from the beginning of classes up to the end of the first semester (June-October) and no pupils were tardy or late in their Mathematics subject.

Table 4: Attendance of Pupils for the 1st and 2nd Quarters

	1 st Quarter			2 nd Quarter		
	Male	Female	Total	Male	Female	Total
No. of Pupils	22	24	46	22	24	46
Average Attendance	22	24	46	22	24	46
Percentage of Attendance	100%	100%	100%	99%	100%	100%
Number of pupils tardy/late	0	0	0	0	0	0

D. Improved the teaching strategy in Mathematics

According to Rivera and Sambrano (1982), as cited by Ducayso (2004), the slow learners have short span of interest; hence, they exactly get bored. Because of this, the teacher should set more interesting environment through discussions, games, puzzles, arts and other exciting activities. It is then the role of a teacher to make the teaching-learning process effective and successful by improving his teaching strategy instead of typical intermediate papers or chalk boards.

The use of Arts In Math (AIM) was a very effective strategy in teaching Mathematics subject. The pupils were provided with different art activities which they enjoyed doing while computing and analyzing mathematical sentences and mathematics word problems.

IV. CONCLUSION

From the findings, the researcher came up with the following conclusions:

1. Arts In Math (AIM) enhanced mastery learning and comprehension of Grade 6-C pupils based from the pretest and posttest. There was a significant difference between the means of pretest and posttest using t-test as the statistical treatment.
2. Arts in Math (AIM) stimulated, motivated and sustained pupils' interest.
3. Arts In Math (AIM) improved the teaching strategy in Mathematics.

V. RECOMMENDATIONS

Based on the findings and the conclusions drawn from the study, the following recommendations are given:

1. Teachers should be encouraged and motivated to use Arts In Math so as to enhance pupils' performance in Math.
2. Integration of Arts should not only be used in teaching Mathematics but also with other subjects.
3. The school head should encourage and support the generation and use of the Arts In Math (AIM).

VI. REFLECTION

Every teacher wants their pupils to learn, to shine and to excel in their classes. Every teacher believes that the success of the learners reflects the success of his way of imparting knowledge to them. Different strategies are being used to ensure that every learner will be able to learn.

In this study, Arts In Math (AIM) was used to make teaching-learning process in Mathematics fun, enjoyable and interesting. At first, it was a tough job for me since I didn't have the skills in arts, but I really wanted to present and teach math concepts in a way that pupils will develop the attitude of "I LOVE MATH." With the saying-"If there's a will, there's a way," I was able to produce different art activities for my pupils even it entailed a lot of hard work and consumed most of my time. Nevertheless, I find contentment when I saw my pupils humming and smiling while doing their individual or group work activities.

With this research, I realized that a teacher should be ARTISTIC. A teacher should possess the following characteristics:

- A**= Artistic and Approachable
- R**= Resourceful
- T**= Thoughtful
- I**= Innovative
- S**= Systematic
- T**= Tender to his/her pupils
- I**= Ingenious
- C**= Creative

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